

Consolidating DO Major Test Range Capabilities



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Executive Summary

Purpose

As budgets decline, the Department of Defense (DOD) is faced with difficult decisions on how best to manage its \$25 billion worth of test ranges. Over the last 3 years, DOD has been working on ways to achieve savings and cut costs through consolidation of test capabilities and streamlined management arrangements. These efforts have drawn the attention of several congressional committees and the Joint Chiefs of Staff, particularly regarding consolidating similar test range capabilities at fewer locations.

The Chairman of the Subcommittee on Defense, Senate Committee on Appropriations, asked GAO to evaluate DOD's progress in consolidating test range capabilities. This report discusses (1) the extent to which DOD achieved savings and benefits through its consolidation efforts and (2) the effectiveness of the interservice consolidation process known as Test and Evaluation Reliance.

Background

DOD tests most of its weapon systems at 22 major test ranges operated by the Army, the Air Force, and the Navy. These ranges cost about \$5 billion annually to operate and are used for testing such items as tanks, munitions, and aircraft. Generic equipment and instrumentation, such as tracking radars, can be found on these ranges, while individual test sites contain equipment and facilities required for specific types of tests.

In 1989, DOD reduced the budget accounts that support both science and technology and test and evaluation by \$3.4 billion over the fiscal year 1991-95 period. About \$729 million of this reduction applies to test and evaluation. Each service initiated its own efforts to accommodate the planned funding reductions. Later, in October 1990, DOD began an interservice effort called Test and Evaluation Reliance. Reliance tasked the services to perform joint studies to establish interservice management arrangements for planning and managing future test investments. It also required an aggressive effort to consolidate existing test capabilities across the services. Because a range has a number of test capabilities, consolidating these capabilities would not necessarily require closing any of the 22 ranges. Rather, each range could specialize in test capabilities for which it is best suited.

Results in Brief

Although DOD has realized some test and evaluation savings to date, it did not realize potentially significant savings through an aggressive consolidation of existing test range capabilities. While some test capability consolidations resulted from intraservice efforts, most savings are

expected through the elimination of overhead positions and reductions to test range support accounts.

The interservice Test and Evaluation Reliance process has laid a foundation for future savings. However, this effort has resulted in minimal savings and relatively few consolidations because DOD did not aggressively pursue consolidations as initially intended. In implementing the process, DOD (1) focused primarily on establishing management arrangements for planning future test investments rather than on specific savings; (2) allowed the individual services to retain their existing test capabilities and control funding, thus reinforcing the status quo; and (3) relied on a study methodology whose weaknesses prevented a full assessment of consolidation opportunities. The lack of an initial cost savings goal and a timetable to realize savings further hampered the aggressive pursuit of consolidations.

The planned test and evaluation budget reduction of \$729 million over the fiscal year 1991-95 period represented a cut of about 2.4 percent. This is a rather modest reduction considering that test and evaluation funding has increased by 25 percent (in constant 1992 dollars) over the last decade. Greater savings are likely to be required as DOD budgets decline. DOD's recently established minimum 20 percent cost savings goal for each Reliance area is indicative that much more needs to be done. Until DOD more aggressively consolidates existing test capabilities, savings of this magnitude are not likely to occur.

Principal Findings

Consolidation Efforts Have Resulted in Minimal Savings

DOD expects to reduce test and evaluation spending by \$729 million through streamlining efforts and other management actions. Army and Air Force intraservice organizational realignments that eliminate management and overhead positions are projected to save \$430 million. In some cases, the two services have or plan to consolidate test capabilities at fewer locations, but savings from these efforts are expected to be minimal or have not yet been determined. The remaining \$299 million is expected to be cut from test and evaluation support accounts.

Relatively minor interservice consolidations are now occurring in three of the nine Reliance test areas completed at the time of GAO's review: land

vehicles, nuclear weapons' effects, and gun munitions testing. DOD officials stated that while savings from these consolidations are expected to be minimal, the Reliance process has begun to overcome barriers to cross-service cooperation. In particular, the establishment of a framework for coordinating and focusing future test investments is viewed by DOD as a significant accomplishment. DOD believes that the greatest potential for duplication exist in test and evaluation facilities supporting electronic warfare and fixed-wing aircraft testing, although it is not anticipated that ongoing Reliance studies will overcome service resistance and make consolidations within the two areas.

DOD Did Not Aggressively Pursue the Consolidation of Existing Test Capabilities

One of the initial objectives of the Reliance process, the consolidation of existing capabilities, was not fulfilled because DOD emphasized the establishment of management arrangements for focusing on future test investments. After the Reliance process began, DOD established a policy to focus on future test investments at key locations and to allow other sites to atrophy for lack of funding and eventually cease operations.

Rather than aggressively pursue consolidations, the process fostered policy decisions that allowed the services to retain their existing test capabilities and funding authority. Specifically, each service is to retain its own capabilities for test planning and evaluation of test data. Rather than providing a lead service with funding authority to function as a single manager over a particular Reliance area—along the lines of an executive agent as recommended by the Chairman, Joint Chiefs of Staff—each service will continue to fund its own test investments. According to a DOD official, the Office of the Secretary of Defense concentrated on future investments because it does not directly control the services' funding. However, the Office of the Secretary of Defense has ultimate control in that it approves service budget requests, and it has exercised such control on major weapon systems.

The Reliance Study Methodology Had Major Weaknesses

The Test and Evaluation Reliance study methodology did not adequately address (1) future test requirements, (2) uniform measures of capacity and use, and (3) cost-benefit analyses. As a result, insufficient data was available to determine whether test and evaluation capabilities could or should be consolidated. For example, DOD was not able to fully assess the feasibility of moving work load from one facility to another because DOD had not determined the capacity of the test ranges to conduct specific types of testing.

In the future, DOD expects to develop 5-year master plans for each Reliance area that, if properly executed, could improve the study methodology and result in more significant cost savings. The plans are to include a minimum cost savings goal of 20 percent for each test area over the 5-year period.

Recommendations

To strengthen the Reliance process for consolidating existing test capabilities, GAO recommends that the Secretary of Defense take the following actions:

- Reaffirm the initial Reliance objective of aggressively pursuing the interservice consolidation of existing facilities.
- Ensure that plans to correct fundamental weaknesses in the study methodology are carried out. These plans should require that (1) future test requirements be clearly identified and validated, (2) uniform capacity and use data be developed, and (3) cost-benefit analyses be conducted that justify savings available from consolidating existing test capabilities.
- Establish interim time frames for planned consolidations to provide a means to gauge progress by the Reliance process.
- Provide a lead service in each Reliance area, with funding authority to serve as a single agent to help eliminate existing duplication of test capabilities.
- Increase oversight of lead service efforts to realize the consolidation of test capabilities.

Matters for Congressional Consideration

If DOD does not take appropriate and timely actions to eliminate duplication of existing test capabilities, the Congress should consider reducing test and evaluation funding to compel DOD to realize significant savings through consolidations.

Agency Comments

As requested, GAO did not obtain official agency comments. However, GAO met with DOD officials to discuss the results of its work and has incorporated their comments where appropriate. DOD officials said that the thrust of Reliance from the outset has been consolidation through future test investments, not consolidation of existing test capabilities. DOD, however, could not produce documentation to support this position, and GAO's review of the guidance provided to study panels showed that aggressively pursuing consolidation opportunities was in fact one of the initial aims of the Reliance process.

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Abbreviations

DOD	Department of Defense
GAO	General Accounting Office
JCG(T&E)	Joint Commanders Group (Test and Evaluation)
OSD	Office of the Secretary of Defense
RDT&E	research, development, test and evaluation
T&E	test and evaluation

Introduction

The Department of Defense (DOD) tests most of its weapon systems at 22 major test ranges operated by the Army, the Air Force, and the Navy.¹ Collectively, the ranges are valued at more than \$25 billion and cost about \$5 billion annually to operate and maintain. The ranges are divided into various test sites that are used to test different types of weapons, such as tanks, munitions, and aircraft. Generic equipment and instrumentation, such as tracking radars, can be found throughout the ranges, while individual test sites contain equipment, instrumentation, and facilities required for specific types of tests.

Consolidation Efforts Prompted by Planned Budget Reductions

In July 1989, the Secretary of Defense issued a report on the Defense Management Review outlining a number of management improvements needed within DOD. As part of these Defense Management Review activities, DOD informed the Subcommittee on Defense, Senate Appropriations Committee, that it reduced its science and technology and test and evaluation (T&E) accounts by \$3.4 billion for fiscal years 1991 through 1995. The science and technology portion of these accounts generally supports research and exploratory development, while the T&E portion generally supports weapon system programs associated with advanced development and beyond. To accommodate this funding reduction, the services in 1989 initiated efforts to achieve savings and cut costs within their own T&E operations. These efforts did not specifically require the consolidation of test capabilities at fewer locations.

Later, in October 1990, DOD began an interservice consolidation effort, called T&E Reliance. Under this effort, DOD tasked the services with establishing management arrangements for planning future test investments across service lines. For example, a lead service could be designated to manage future investments for a particular test capability. DOD also stipulated that through T&E Reliance, the services should aggressively pursue the consolidation of existing capabilities where these capabilities were duplicative. Since each range has a number of diverse test functions, consolidating test capabilities would not necessarily mean that any of the 22 major test ranges would close. Instead, the test ranges could specialize in certain types of testing for which they are best suited.²

¹These 22 major test ranges are collectively known as the Major Range and Test Facility Base. (See app. I for a list of these ranges and app. II for their locations.)

²For example, the Air Force Development Test Center's mission includes the T&E of non-nuclear munitions, electronic combat, and navigation/guidance systems. To the extent that the Center duplicates test functions conducted at other major test ranges (such as electronic combat testing), resources may be unnecessarily expended at redundant facilities.

Under the Reliance process, triservice panels conducted technical studies of the following 12 test areas with triservice capabilities: (1) land vehicles, (2) chemical and biological effects, (3) nuclear weapons' effects, (4) air breathing engines, (5) ground and air targets, (6) gun munitions, (7) air-to-air and air-to-surface weapons, (8) surface-to-air weapons, (9) T&E support aircraft, (10) electronic warfare, (11) fixed-wing aircraft, and (12) electric guns.³ After completing the studies, the panels evaluated the alternatives and made specific technical recommendations on management arrangements, future investment strategies, and potential consolidations.

The Director, Test and Evaluation,⁴ within the Office of the Secretary of Defense (OSD), heads the T&E Reliance process. He reports to the Under Secretary of Defense for Acquisition, who is responsible for overseeing the acquisition of major weapon systems. The Director has final authority for approving the panels' recommendations and for issuing decision memorandums on the studies. He is assisted by the Defense Test and Evaluation Steering Group, which approves the overall schedule of studies, reviews intermediate study results and progress, approves recommendations and alternatives, and recommends a course of action to the Director. The Joint Commanders Group for Test and Evaluation (JCG(T&E)), a triservice organization reporting to the Steering Group, manages the execution of this process by providing guidance for the studies, reviews the methodology and scope of the studies, and recommends approval of the initial study results.

Because T&E Reliance is a multiservice process, it allows multiple appeal opportunities during internal service reviews and reviews by the defense organizations involved. For example, the Director approves T&E Reliance studies and identifies the service responsible for preparing memorandums of agreement. These agreements, signed by the service acquisition executives, document all decisions reached and assign responsibilities to the various services for such things as establishing a single point of contact for reviewing test requirements, focusing future test investments at key locations, and consolidating test capabilities as indicated by the T&E Reliance studies.

³The Reliance panels began their studies in fiscal year 1991 and had completed nine at the time of our review. The three uncompleted studies were electronic warfare, fixed-wing aircraft, and electric guns.

⁴Formerly the Deputy Director of Defense, Research and Engineering (Test and Evaluation).

Objectives, Scope, and Methodology

We reviewed DOD's progress in consolidating similar T&E capabilities at fewer locations at the request of the Chairman, Subcommittee on Defense, Senate Committee on Appropriations. Our objectives were to determine (1) the extent to which DOD achieved savings and benefits through its consolidation efforts and (2) the effectiveness of T&E Reliance. We also addressed T&E funding trends over the last decade because of interest in past and present T&E funding levels.

In the Washington, D.C., metropolitan area, we worked at OSD's Office of the Director, Test and Evaluation; service T&E headquarters; and the Institute for Defense Analyses, which supports OSD with test resource analyses. We also visited the JCG(T&E), Andrews Air Force Base, Maryland; White Sands Missile Range, New Mexico; Air Force Flight Test Center, Edwards Air Force Base, California; Air Force Development Test Center, Eglin Air Force Base, Florida; and U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland.

In identifying the savings and benefits from consolidation efforts, we interviewed OSD and service officials responsible for Defense Management Review activities to determine the portion of the \$3.4 billion budget reduction attributable to T&E. This audit step included identifying any savings or benefits expected from the T&E Reliance effort. We also analyzed documentation for projected T&E savings. In addition, we interviewed officials about their consolidation efforts and obtained documentation on whether these efforts resulted in the consolidation of test capabilities at fewer locations.

To determine whether the T&E Reliance process was working as intended, we interviewed OSD and service officials and obtained information on how the process was organized and managed. We reviewed guidance provided to the Reliance study panels; individual service comments on the panels' reports; final reports presented to the JCG(T&E); minutes to JCG(T&E) meetings; Defense Test and Evaluation Steering Group minutes of meetings; and, when available, Reliance decision memorandums and memorandums of agreement.

We evaluated completed T&E Reliance studies to determine whether (1) the study panels used the standard methodology developed for T&E Reliance and (2) the methodology allowed a full assessment of potential consolidations.⁶ We did not analyze 3 of the 12 studies because they had

⁶We reviewed the studies on land vehicle testing, air breathing engines, chemical and biological defense, nuclear weapons' effects, ground and air targets, gun munitions testing, surface-to-air testing, air-to-air and air-to-surface testing, and T&E support aircraft.

not been completed at the time of our review.⁶ Our analysis of the methodology also included other factors that we considered key to analyzing potential consolidations, such as future test requirements and cost-benefit analyses. As part of this analysis, we evaluated DOD's efforts to develop a uniform work load measurement system and reviewed available use data developed by the test ranges.

To evaluate funding for the major test ranges over fiscal years 1982-92, we relied on our past report that evaluated the ability by DOD's budgeting system to aggregate T&E funding.⁷ In addition, we contacted the Institute for Defense Analyses to obtain detailed information on test range funding. The Institute supports OSD by conducting analyses of T&E funding for the Director, Test and Evaluation.

We performed our work between February and October 1992 in accordance with generally accepted government auditing standards. As requested, we did not obtain official agency comments on this report. However, we discussed the information in the report with DOD officials and have included their comments where appropriate.

⁶We did not review the fixed-wing aircraft, electronic warfare, and electromagnetic gun testing studies.

⁷Test and Evaluation: DOD's Fiscal Year 1989 Test Resource Budget (GAO/NSIAD-90-177FS, Sept. 25, 1990).

Savings From Current Consolidation Efforts Are Expected to Be Minimal

DOD expects to absorb planned reductions in T&E spending primarily by achieving savings through organizational realignments and by making cuts to T&E support accounts within each military service. The services also have taken steps to consolidate some of their test capabilities; however, these intraservice efforts have not resulted in significant savings when compared to the total T&E budget. Similarly, savings from the consolidation of test capabilities across services under the T&E Reliance process are expected to be minimal. Although DOD is currently evaluating two test areas with the greatest potential for duplication, it is not anticipated that significant consolidations will be recommended in ongoing Reliance studies. Nonetheless, DOD believes that the Reliance process has had a positive impact on the test community by establishing interservice management arrangements to plan future test investments for specific test capabilities.

Results of Intraservice Efforts

Through intraservice streamlining efforts and other management actions, DOD expects to reduce T&E spending by \$729 million, or about 2.4 percent of the estimated \$30 billion to be spent on T&E in fiscal years 1991 through 1995.¹ So far, DOD has identified potential savings of \$430 million, attributable to the realignment of Army T&E activities (\$305 million) and the restructuring of the Air Force Systems Command (\$125 million). Through these organizational changes, management and overhead positions are being eliminated and administrative expenses reduced. The remaining \$299 million will be cut from accounts that support the ranges. Table 2.1 summarizes the expected T&E savings and account reductions.

¹The \$30 billion estimate includes user fees. According to DOD officials, the reductions are to be made only to those T&E accounts that directly support the major test ranges, excluding indirect funding sources such as user fees. On this basis, T&E spending reductions would be slightly higher—about 3 percent.

Chapter 2
Savings From Current Consolidation Efforts
Are Expected to Be Minimal

Table 2.1: DOD Projected T&E Savings and Reductions (Fiscal Years 1991-95)

Dollars in millions	
Activity or reduction	Amount
Realignment of Army T&E activities	\$305
Restructuring of Air Force Systems Command	125
Subtotal	430
Army account reductions	
T&E support accounts	23
Air Force account reductions	
Lab and T&E accounts	58
Single funding pool for initial operational T&E	27
Technical/engineering activities	3
Navy account reductions	
Research, development, test and evaluation accounts	32
Air labs	32
Contract advisory and assistance services	6
Military construction projects	60
Other accounts	58
Subtotal	299
Total	\$729

Source: GAO analysis of DOD data.

Army Consolidation Efforts

By realigning T&E activities, the Army expects to save \$305 million and eliminate 1,307 management and overhead positions by the end of fiscal year 1993. More than half the savings are to be realized by consolidating the U.S. Army Test and Evaluation Command with other development testing activities.² This consolidation was to be completed by fiscal year 1993, saving \$168 million and eliminating 669 positions. Of these positions, 185 were at White Sands Missile Range, New Mexico, and 181 were at the U.S. Army Combat Systems Test Activity, Aberdeen Proving Ground, Maryland.

The consolidation of operational test activities to form the U.S. Army Operational Test and Evaluation Command was completed in fiscal year 1991, saving \$101 million and eliminating 608 positions.³ The consolidation

²Development testing, part of the engineering design and development process, is aimed at verifying attainment of technical performance specifications and objectives.

³Operational testing is done to evaluate a system in its intended environment when operated, maintained, and supported by personnel having the same qualifications as those in the field.

created a new operational T&E headquarters in Alexandria, Virginia; expanded the Test and Experimentation Center at Fort Hood, Texas; and incorporated responsibilities for developing and acquiring threat simulators. The consolidation also included closing four test boards and moving their functions to Fort Hood, which is primarily a training range; reducing three test boards to test directorates; closing an experimentation board;⁴ and taking various other management actions.

As a part of these efforts, the Army has consolidated some test activities and capabilities. We were informed that a small arms unit was moved from Fort Dix, New Jersey, to the U.S. Army Combat Systems Test Activity at Aberdeen Proving Ground, Maryland, eliminating five positions. In addition, test capabilities at Fort Ord, California, were consolidated at Fort Hunter Liggett, California, eliminating 73 positions.

Finally, by assessing a budget reduction and by eliminating 30 T&E positions in the Strategic Defense Command and the Information Systems Command, the Army saved over \$36 million.

Air Force Consolidation Efforts

In July 1992, the Air Force Systems Command was combined with the Air Force Logistics Command to create the Air Force Material Command, eliminating 1,230 T&E positions and saving about \$125 million. We were informed that these positions included management and overhead positions at the major test ranges.

The Air Force plans to consolidate the 4950th Test Wing from Wright-Patterson Air Force Base, Ohio, with the 6510th Test Wing at the Air Force Flight Test Center, Edwards Air Force Base, California, in fiscal year 1995. Although the Air Force expects to eliminate personnel and operational expenses, DOD has not yet determined whether actual savings will result from the consolidation of these test capabilities.

Other consolidation efforts included the following:

- An Air Force Test and Evaluation Office was created, combining test policy formulation and resource acquisition. No positions were eliminated.
- Operational T&E activities were realigned under the Air Force Operational Test and Evaluation Center. No positions were eliminated.

⁴These offices plan, conduct, and report on the results of testing and field experiments involving doctrine, training, organization, and material relating to major weapon systems.

Navy Consolidation Efforts

The Navy plans to consolidate various research, development, test and evaluation (RDT&E) activities into four warfare centers and one lab. Although Navy officials said that testing was generally performed at most sites within the warfare centers, the Navy protected these T&E capabilities when developing its consolidation plans. Savings from the consolidations are expected primarily from eliminating overhead functions incidental to the test range operations. However, the Navy has not determined the amount of savings directly attributable to T&E.

Results of Interservice Efforts

Savings from the interservice consolidations are expected to be minimal or have not yet been determined. In addition, it is not anticipated that Reliance studies will result in significant consolidations in two test capability areas with the greatest potential for duplication. Nonetheless, DOD officials believe that the Reliance process has yielded several benefits, including a significant cultural change in the test community, increased oversight, streamlined management arrangements to focus future investments at specific locations, and increased communication.

Expected Savings From Planned Consolidations Minimal or Not Yet Determined

Consolidations of existing test capabilities are occurring or planned in three relatively minor areas: land vehicles, nuclear weapons' effects, and gun munitions. Savings from these consolidations are expected to be minimal or have yet to be determined.

- Instead of moving a land vehicle testing activity as planned from Twenty-nine Palms, California, to the Naval Air Warfare Center Weapons Division, China Lake, California, DOD will move the activity to the Army's Yuma Proving Ground in Arizona. DOD believes that some costs to develop a test site at China Lake will be avoided because the Yuma facility already supports land vehicle testing. No personnel reductions are anticipated.
- As recommended by the nuclear weapons' effects study, Army and Air Force electromagnetic pulse facilities are to be consolidated under Army management, with some expected personnel or contractor savings. Additionally, various dual-purpose facilities are not to receive further T&E funding but are to be retained by the science and technology community. The Reliance study team did not attempt to estimate the savings resulting from these efforts.
- On the basis of the results of the gun munitions study, DOD closed one large and two small depleted uranium munitions testing sites. These sites consisted of structures filled with sand into which depleted uranium munitions were fired. We were informed that closing these facilities

reduces the need to dispose of hazardous materials, resulting in minimal cost savings.

In addition to these consolidations, T&E Reliance planned to gradually consolidate test capabilities in two areas: targets and air breathing engines.

- The targets study recommended that the services phase out duplicative efforts in four target areas: full-scale fixed-wing targets; subscale fixed-wing targets; towed targets; and target command and control. No date for these consolidations has been set.
- As a result of the air breathing engines study, the medium engine test capability at the Naval Air Warfare Center Aircraft Division, Trenton, New Jersey, was to gradually move to the Arnold Engineering Development Center, Arnold Air Force Base, Tennessee, possibly eliminating 50 T&E positions. Small engine testing was to remain at Trenton. In March 1993, as part of its base closure and realignment efforts, DOD proposed closing Trenton and relocating generally all of its in-house air breathing engine test capabilities to the Air Force location. Some other testing functions would relocate to the Naval Air Warfare Center, Patuxent River, Maryland. However, DOD made this proposal outside of the reliance process, based on its forecast of declining work load. (See ch. 3.)

Benefits Cited by DOD

DOD believes the T&E Reliance process has caused a major change in the way its test community does business, providing for a cooperative, corporate review process while preserving decentralized execution of T&E activities by the services. The major benefits cited by DOD are the following:

- T&E Reliance has established several new management arrangements to plan for test investments in specific test areas, breaking down heretofore untouchable service barriers. For example, the Joint Oversight Council for Air Breathing Engines has been established to oversee the air breathing engine testing area. In addition, a lead service has been designated for almost all the test areas to make recommendations on future test investments. The Army, for example, was designated the lead service for land vehicle testing.
- Through T&E Reliance, DOD has decided that future T&E investments will be focused at primary and specialty locations to reduce duplication.
- As part of the T&E Reliance effort, DOD has established a T&E Reliance and Investment Board to serve as the administrative arm of the JCG(T&E). The

Board is to integrate T&E investment plans for each Reliance area into a test resource master plan and investment strategy.

Test Facility Duplication Has Been Identified

A 1990 DOD study conducted before the Reliance process was initiated found that the greatest overlap in capabilities existed in T&E facilities supporting electronic warfare and fixed-wing aircraft. Both the Air Force Development Test Center, Eglin Air Force Base, Florida, and the Naval Air Warfare Center Weapons Division, China Lake, California, maintain open air ranges for electronic warfare testing. Similarly, the Naval Air Warfare Center Aircraft Division, Patuxent River, Maryland, and the Air Force Flight Test Center, Edwards Air Force Base, California, both test fixed-wing aircraft.

In October 1992, the Director, Test and Evaluation, informed the Chairman of the Joint Chiefs of Staff about consolidation options that were not yet identified by the Reliance process. These potential consolidations included Air Force and Navy facilities that test against electronic warfare threats as well as high performance fixed-wing aircraft testing in the southwest United States. Because of service resistance to consolidating these existing test capabilities, the Director, Test and Evaluation, stated that it is not anticipated that ongoing T&E Reliance studies addressing these issues would result in significant consolidations.

T&E Reliance De-Emphasized Consolidating Existing Test Capabilities

Interservice consolidations have generally not occurred because an initial objective of the T&E Reliance process—to aggressively consolidate existing test capabilities—was not carried out as intended. The consolidation objective was not fulfilled, and the sole objective of T&E Reliance became the establishment of management arrangements for focusing future test investments. Further, significant interservice consolidations did not occur because the services maintained their independence by retaining existing test capabilities and the responsibility for managing and funding test investments. DOD officials stated that the emphasis on future test investments was appropriate and consolidation of existing test capabilities at fewer locations was not emphasized. As pressures to reduce T&E funding mount, however, we believe a renewed emphasis on consolidating existing facilities has become necessary.

Guidance Anticipated Interservice T&E Consolidations

The initial Reliance guidance issued by the JCG(T&E) in October 1990 stated that the thrust of T&E Reliance was to reduce duplication of effort through the designation of interservice management arrangements. Although the guidance did not contain a specific cost savings goal, it required “. . . an aggressive inter-service T&E consolidation effort.” Similarly, the accompanying description of the T&E Reliance process stated that “. . . this process can be applied to current capabilities that may exist in more than one service.” It further stated that “. . . selected capabilities among the services will be analyzed for potential consolidation/interdependence to reduce operating and investment costs.”

In December 1990, the Defense Test and Evaluation Steering Group requested that the JCG(T&E) ensure that the Reliance studies emphasize consolidation as a primary Reliance objective. Follow-on guidance issued by the JCG(T&E) tasked the study panels to “. . . formulate initiatives to optimize test investment costs, improve productivity and quality, ensure timely availability of test resources, and reduce the overall cost of T&E.” The guidance stated that “This includes recommending consolidations of specific functional testing capabilities when needed.”

The T&E Reliance studies were to produce an outline of existing capabilities, address potential consolidations and management arrangements, and make final recommendations. In fact, all nine studies we reviewed addressed the issue of consolidating existing testing capabilities at fewer locations. For example, the gun munitions study evaluated 11 options for consolidating test capabilities at fewer locations,

including consolidating all aircraft gun testing at the Air Force Development Test Center, Eglin Air Force Base, Florida.

DOD Did Not Aggressively Pursue the Consolidation of Existing Test Capabilities

DOD has not used the T&E Reliance process to aggressively pursue interservice consolidations of existing test capabilities. Rather, interservice consolidations were de-emphasized in favor of establishing management arrangements for focusing future test investments at key locations while allowing other sites to atrophy for lack of funds. Further, the process allowed the services to maintain their independence.

Emphasis on Consolidations Weakened

A series of decisions led to a de-emphasis on consolidating existing capabilities. Early on, the JCG(T&E) decided that cost-benefit analyses were not required in the Reliance studies. The question of whether such analyses were required arose during the initial stages of the land vehicles study (one of the earliest Reliance studies) and was referred to the JCG(T&E). At a December 1990 meeting, the JCG(T&E) decided that specific cost savings were outside the scope of the Reliance studies due to time and resource constraints.

The emphasis on aggressively pursuing T&E consolidations was further weakened in May 1991. During the air breathing engines study, the study panel members discussed the possibility of directing work load to specific locations to more quickly consolidate test capabilities. In response, the Chairman, JCG(T&E), stated that as a matter of policy the Reliance process was to make recommendations related to future investments only.

Later, in September 1991, DOD informed the Senate Appropriations Committee that the thrust of the T&E Reliance studies was to propose an interservice arrangement for management responsibilities and to designate primary and specialty sites for focusing future test capabilities. DOD told the Committee that it did not expect adjustments in facility ownership among the services to be realized until fiscal years 1994 through 1999.

Services' Maintained Their Independence

In July 1990, before creating T&E Reliance, DOD evaluated the possibility of establishing a defense test agency to oversee, manage, and fund the services' T&E activities. However, OSD and the services subsequently agreed on a more cooperative approach. This approach resulted in creation of the T&E Reliance process in October 1990 to ensure that the necessary level of interdependence and consolidation was achieved.

For those lead services assigned to most Reliance areas, the lead service could have functioned as a single manager for each specific T&E area. However, policies established during the T&E Reliance process maintained the independence of the individual services, as opposed to having a "lead service" entirely manage test capabilities in a given area. Because of the services' desire to retain their existing test capabilities, these policies, in our view, significantly weakened the possibility for consolidations under the Reliance process.

Early in the T&E Reliance process, a decision was made that each service would retain its own test capabilities and expertise for test planning and evaluation of test data. An OSD official explained that even under DOD's revamped weapon system acquisition approach, the services will continue to manage their own weapon system acquisition programs. To accomplish this effectively, the OSD official said, the services need to control their own test capabilities. For example, each of the services will retain test capabilities for fixed-wing aircraft testing, even though DOD recognizes that these capabilities are duplicative.

In October 1991, the T&E Reliance participants adopted a policy that allowed the individual services to fund investments to resolve identified T&E problems. Again, the rationale was that if the services did not control funding or facilities for a specific test capability, they would not be able to effectively support their weapon system programs.

For example, during the approval of the nuclear weapons' effects study, the issue of who would control test investment funding arose. After considerable debate, a consensus was reached among the T&E Reliance participants that the lead service would only have an advisory role on test investments while the funding decisions would continue to reside with the services. The services stressed that allowing the lead service to control funding would set a precedent which would undermine the cooperative nature of the Reliance process.

Further, during the ground and air targets study, the T&E Reliance participants examined the possibility of establishing a joint systems office to manage target development.¹ After evaluating this alternative management approach, they concluded that although a Joint Target Coordination Committee was required for coordination and planning, the services should retain most of their responsibilities, including funding.

¹An OSD official explained that such an office would provide a model of systems engineering concentration, standardized requirements, joint acquisition strategies, and infrastructure support.

Future T&E Budgetary Reductions Are Likely to Require Renewed Emphasis on Consolidations

Although DOD stated that T&E has been funded at approximately the same level during the past 10 years, our analysis showed that T&E funding increased by 25 percent in constant 1992 dollars when charges to customers that use the ranges and other funding sources are included (see app. III). However, because of reduced defense spending, it is likely that future T&E funding levels will be significantly less than previously thought. Considering the calls by the Senate Appropriations Committee and the Chairman of the Joint Chiefs of Staff for more aggressive consolidations to reduce the T&E infrastructure, the \$729 million reduction to T&E funding in fiscal years 1991 through 1995—about 2.4 percent—appears quite modest. DOD has recognized the need for greater savings and has established a goal to achieve savings of at least 20 percent for each reliance area during fiscal years 1996 through 2000.

The Appropriations Committee has called on DOD to reduce spending for T&E facilities. In its report on the fiscal year 1992 defense appropriations bill, the Committee expressed reluctance to appropriate funds to maintain test facilities that provide excess capacity or duplicative capability and that “may be unsupportable as defense spending declines.” Later, in its report on the fiscal year 1993 defense appropriations bill, the Committee stated that the T&E Reliance process had basically certified the existing status quo. The Committee was very concerned that this approach would result in an unaffordable test infrastructure in the future and would fail to maximize the benefits to DOD from the investment of limited funds in testing facilities.

In September 1992, the Chairman of the Joint Chiefs of Staff expressed concern about the apparent degree of duplication and excessive capacity in the T&E infrastructure, especially in test ranges and facilities. He explained that operating costs should be reduced as DOD’s acquisition strategy slows the rate at which new programs are started. Although the Chairman acknowledged that Reliance has made significant progress in planning the consolidation of several test areas, he believed that even greater benefits are possible through aggressively identifying specific near-term actions to streamline the infrastructure, especially through existing range facility consolidations and closures. He therefore asked the services to accelerate their efforts by defining a T&E infrastructure objective and a plan to achieve it.

Later, in February 1993, the Chairman of the Joint Chiefs of Staff recommended to the Secretary of Defense that an executive agent be designated to streamline T&E infrastructure. The executive agent, as a

single manager for the T&E ranges, would help DOD eliminate unnecessary T&E infrastructure—duplicate jobs, ranges, and installations.

DOD's Base Closure and Realignment Process

If DOD identifies possible consolidations of existing test capabilities, such as through the Reliance efforts, these consolidations may fall within the coverage of the Defense Base Closure and Realignment Act of 1990 (Title XXIX, P.L. 101-510). This act provides a process for closing and realigning U.S. military bases and requires DOD to submit a list of proposed base closures and realignments to the Defense Base Closure and Realignment Commission, an independent commission established to review DOD's proposals and make final recommendations.² The Commission's recommendations must then be approved by the President and, unless the Congress disapproves, the recommendations become final.

Views of Agency Officials

DOD officials believe we expected too much from the T&E Reliance process. They noted that savings were expected to be gradual and that T&E Reliance did not have a cost savings goal or timetable for measuring progress. According to DOD officials, the thrust of the Reliance process from the outset has been consolidation through future test investments, not consolidation of existing test capabilities. An OSD official also noted that OSD had to focus its attention on future test investments because it does not directly control the services' funding. Another OSD official added that the original intent of Reliance to consolidate existing capabilities was relaxed because the services viewed their intraservice efforts as the main way to absorb planned budget reductions.

DOD officials also stated that investments in T&E infrastructure and equipment have not kept pace with needs. They noted that although fewer weapon systems will likely be procured in the future, the need for testing will remain relatively constant over the next few years. Therefore, DOD officials believe that within declining budgets, increased funding is needed for repairing the T&E infrastructure and acquiring equipment to test more complex weapon systems.

Our documentation shows that consolidation of existing test capabilities was included as a Reliance objective, as discussed in this chapter. DOD

²The Defense Base Closure and Realignment Act of 1990 requires that the Defense Base Closure and Realignment Commission approve the closure of any military installation where at least 300 civilian personnel are authorized to be employed, or any realignment involving a reduction by more than 1,000, or by more than 50 percent, in the number of civilian personnel authorized to be employed at an installation employing at least 300 civilian personnel.

produced no documentation to the contrary. Further, the services' internal consolidations did not produce significant savings. In fact, a more aggressive Reliance effort could have helped achieve additional savings. If additional T&E investments are required, we believe savings produced by an aggressive consolidation effort could prove a valuable source of funds. In addition, while OSD does not directly control the services' funding, it does so indirectly by approving the services' budget requests. OSD has exercised this control in the past, particularly regarding the cancellation and deferral of major weapon system programs.

The Reliance Study Methodology Had Major Weaknesses

Consolidation assessments were significantly hampered by weaknesses in the study panels' methodology. While all panels addressed the issue of consolidating test capabilities at fewer locations in those studies we reviewed, they generally lacked sufficient data to fully assess consolidation opportunities. As a result, the panels did not compare future test requirements with existing capabilities to determine whether shortfalls or excess capacity existed. In the future DOD plans to improve its study methodology, which, if properly implemented, could help overcome many of the weaknesses we found.

Methodology for Most Studies Lacked Critical Elements for Assessing Consolidations

We reviewed DOD's study methodology to determine whether it provided useful information for evaluating test capabilities. According to guidance provided to the panels, their studies were to address (1) existing test capabilities, (2) the practicality of subdividing the test capability, (3) capacity and use measurements, (4) measurements other than capacity and use, (5) feasible alternatives that provide equivalent degrees of capability, (6) the consolidation of capabilities to fewer sites, (7) the establishment of management arrangements to plan future test investments, and (8) recommendations. The panels had the option to—and often did—omit areas from the methodology.

We found that the existing methodology and resulting studies did not lead to consolidation of capabilities into fewer sites (as discussed in the preceding chapters) or generate comparable capacity and use statistics. In order to make this assessment, we developed more specific criteria in the eight areas mentioned above,¹ particularly regarding adequacy for assessing consolidation opportunities. We also identified two areas that we considered important to assessing consolidation opportunities that were not specifically included in the methodology—identification and documentation of future test requirements and cost-benefit analyses. Most of the studies we reviewed had not provided adequate coverage of these two areas, as well. Figure 4.1 summarizes the results of our review of the study methodology.

¹For example, the methodology included an area to establish a procedure for assessing work load and utilization of the particular test capability. Because the criterion was somewhat general in nature, we developed a more specific criterion by assessing whether uniform measures of capacity and use were quantified by the study.

Chapter 4
The Reliance Study Methodology Had Major Weaknesses

Figure 4.1: Adequacy of the T&E Reliance Study Methodology

Methodology area with criterion for assessment	Studies								
	Land Vehicles	Chemical and Biological Effects	Nuclear Effects	Air Breathing Engines	Ground and Air Targets	Gun Munitions	Surface-to-Air	Air-to-Air/Air-to-Surface	T&E Support Aircraft
Positive features									
Existing capabilities—Was a large percentage of capabilities identified?							●		
Subdividing capability—Were sub-areas of capabilities identified?									
Feasible alternatives—Were pros and cons of alternatives identified?	●								●
Other measurements—Were factors other than capacity and use identified?								●	
Management concept—Was the management concept justified?									
Recommendations—Were significant changes to management or test capability realized?		●					●		
Weaknesses									
Capacity and use measurements—Were uniform measures of capacity and use quantified?	●	●	●				●	●	●
Consolidations—Did studies lead to short-term consolidation of capabilities?		●		●	●		●	●	●
Future test requirements—Was the potential work load of future weapon systems identified?	●	●	●			●	●	●	●
Cost-benefit analysis—Was a financial analysis made of potential consolidations?	●	●	●	●	●	●	●	●	●

□ = Yes, adequate coverage

● = No, inadequate coverage

Uniform Measures of Test Capacity and Use Were Not Developed

Of the nine T&E Reliance studies we reviewed, only three (air and ground targets, air breathing engines, and gun munitions) developed uniform capacity and use data.² However, panel members for two studies questioned the reliability of the capacity and use data developed. The co-chairman of the gun munitions panel said that the data did not influence the panel's recommendations, which it instead based on "professional judgement." The six remaining studies either lacked uniform capacity and use data or panel members stated the data was unavailable or unnecessary. For instance, capacity data was not addressed by the air-to-air/air-to-surface study, according to panel members. They said that in their judgment, the applicable test locations were near capacity.

We believe that the absence of reliable uniform capacity and use data in the Reliance studies prevents an effective evaluation of existing test capabilities. In 1990, we proposed a framework that DOD could use to measure the use and capacity of its test facilities.³ Recognizing that test ranges offering similar capabilities also perform similar test functions, we proposed to uniformly measure use and capacity based on a functional approach (such as air-to-air or air-to-ground testing and aircraft flight performance testing). In fiscal year 1991, the House Appropriations Committee directed that DOD use our proposed work load measurement system or an equivalent. In response, DOD is now developing a Range Utilization Measurement System. However, according to DOD, the system will not measure capacity but will serve as a gross indicator of facility use.

The Senate Appropriations Committee has also shown interest in DOD's efforts to develop a uniform work load measurement system for the test ranges. In its markup of the fiscal year 1992 budget, the Committee directed that DOD develop a standard measure defining the use of each service's test facilities to support any requested funding for fiscal year 1993.

Future Test Requirements Were Not Identified

Although we recognize the difficulties in obtaining data on future test requirements, the T&E Reliance studies generally did not identify or validate weapon systems to be tested and their associated work load. Such requirements are essential because they not only establish demand for a specific test function, but also serve as a starting point for evaluating

²Capacity is defined as the total time the ranges, test areas, and other major facilities could have supported the particular test function during normal operating hours.

³Test and Evaluation: A Proposed Framework for Measuring the Use of Test Facilities (GAO/NSIAD-90-91, Aug. 8, 1990).

potential consolidations. If future test requirements had been compared with existing capabilities, DOD would have been better able to determine whether insufficient or excess test capacity existed.

In its report on the fiscal year 1992 DOD appropriations bill, the Senate Appropriations Committee underscored the importance of future requirements. The Committee recommended that DOD's testing efforts be restrained or reduced based on the test requirements for major weapon systems projected under future defense budgets. The Committee further stated that excessive funds should not be invested in facilities that may have significantly modified roles and missions in the future.

Only two of the T&E Reliance studies we reviewed—ground and air targets and air breathing engines—attempted to identify future test requirements. However, the panel chairman for the ground and air targets study said that obtaining accurate and reliable requirements was difficult because the services projected future requirements in various ways. He said that the panel generally used whatever information was available.

For six of the seven other studies, the panel chairmen indicated that identifying future test requirements would have been beneficial, although two chairmen questioned the validity of available future requirements data. According to the gun munitions panel co-chairman, an assessment of future requirements would have benefited the study. He said that an evaluation of the Navy's future test requirements might have raised questions about the need to maintain the Navy's current test capabilities. Also, after the surface-to-air study was completed in May 1991, the panel chairman informed us that the Army evaluated the impact of the diminished Soviet threat and found that future requirements for air defense test capability had decreased. As a result, the Army is considering eliminating personnel engaged in air defense testing at White Sands Missile Range.

Cost-Benefit Analyses Were Excluded

The T&E Reliance panels were not required to and therefore did not include cost-benefit analyses of consolidation opportunities. We believe that cost-benefit analyses are critical to determining the economic feasibility of consolidating existing test capabilities. As noted below, the panels had varying views on the use and benefits of such analyses.

- According to the gun munitions study panel co-chairman, the panel evaluated possible consolidations by using gross estimates of potential

costs, such as the cost of moving Navy gun placements from one location to another. Because it was fairly clear what types of gun munitions could be consolidated, the panel considered these gross indicators to be adequate.

- According to the surface-to-air study panel chairman, panel members had neither the time nor the financial expertise to conduct detailed cost-benefit analyses. However, he stated that the panel considered gross indicators to be adequate.

We believe that merely reviewing gross indicators of costs and benefits is not sufficient for making important consolidation decisions. Rather, detailed cost and benefit data must be collected and analyzed to provide a documented case to help decide whether to consolidate existing test capabilities.

DOD's Planned Actions

In the future, DOD expects to develop individual 5-year Test Capability Master Plans that will implement T&E Reliance decisions for each area. If properly implemented, these plans could address weaknesses in the study methodology. These plans, which cover fiscal years 1996 through 2000, are projected to significantly reduce the fiscal year 1996 defense budget. They are intended to provide "road maps" for future investments in the various Reliance areas, such as land vehicle, gun munitions, and electronic warfare testing. For example, the plans are expected to identify future test capability requirements; to develop a baseline description of staffing, funding, and use (current and 2 prior years); and to project work load (current plus 4 years). Further, they are supposed to identify opportunities for potential closures, consolidations, and realignments of existing test capabilities. As discussed in chapter 3, the plans are to have a goal of reducing T&E spending by at least 20 percent in each test area covered by the Reliance process. However, an OSD official stated that the plans must first address the difficult task of identifying the specific test capabilities and level of funding supporting each test area.

Conclusions, Recommendations, and Matters for Congressional Consideration

Conclusions

By creating the T&E Reliance process, DOD laid the groundwork for significant savings to be realized in the future. The first phase of the process was a study effort that resulted in memorandums of agreement that set out lead service and agency responsibilities for managing particular test areas. During the second phase, implementation plans will be developed to provide road maps that are to lay out the overall direction for a particular Reliance area and identify the need for future test investments. Such efforts may eventually lead to consolidations of test capabilities.

DOD has sought to improve interservice cooperation through T&E Reliance by establishing management arrangements for planning future test investments in specific test areas. However, these efforts have not produced significant savings because they generally did not eliminate duplicate test capabilities at the major test ranges. For the most part, significant savings have not occurred because the objective to aggressively consolidate existing test capabilities was de-emphasized, DOD allowed the services to control decisions over their test capabilities, and a comprehensive study methodology was lacking. The lack of an initial cost savings goal and a timetable to realize savings further hampered the aggressive pursuit of consolidations.

The planned reduction of \$729 million over the fiscal year 1991-95 period represented a cut of about 2.4 percent. This is a rather modest reduction considering that T&E funding has increased by 25 percent (in constant 1992 dollars) over the last decade. Greater savings are likely to be required as DOD budgets decline. Moreover, the Senate Appropriations Committee and the Chairman of the Joint Chiefs of Staff have emphasized the need for greater savings through consolidations. DOD's recently established minimum 20 percent cost savings goal is indicative that much more needs to be done. Until DOD more aggressively consolidates existing test capabilities, savings of this magnitude are not likely to occur. Recently, DOD took a more aggressive stand to consolidate air breathing engine test capabilities across the services, but this proposal was made outside the T&E Reliance process.

To effectively manage T&E capabilities with less funding will require reaffirming the T&E Reliance objective to aggressively pursue consolidation of existing facilities to eliminate duplication (which may or may not involve closing entire major test ranges). One way to help achieve this objective is to strengthen the lead service arrangement by giving the lead service direct funding authority to ensure that more control is exercised

over the individual services' test capabilities. In order for this management arrangement to be effective, OSD must provide increased oversight to ensure that the lead service carries out its responsibilities properly.

Aggressively pursuing consolidations will also require a comparison of future test requirements with existing capabilities. We recognize the difficulties and complexities involved in identifying future test requirements for determining potential work load and developing uniform capacity and use measurements. However, this information would not only identify opportunities to consolidate, but would also determine whether shortfalls exist. Decisions on how much test capability should be funded—and the need to eliminate unwarranted duplication—cannot be fully addressed until better information is available on validated future test requirements, test range capacity and use, and the results of cost-benefit analyses. Additional data, by itself, will not be enough—the data must be accurate, reliable, and consistent from capability to capability.

Finally, overlaying interim time frames on the cost savings goal would not only serve to keep the Reliance effort aggressive, but would also provide a means to gauge progress.

Recommendations

To strengthen the Reliance process for consolidating existing test capabilities, we recommend that the Secretary of Defense take the following actions:

- Reaffirm the initial Reliance objective of aggressively pursuing the interservice consolidation of existing facilities.
- Ensure that plans to correct fundamental weaknesses in the study methodology are carried out. These plans should require that (1) future test requirements be clearly identified and validated, (2) uniform capacity and use data be developed, and (3) cost-benefit analyses be conducted that justify savings available from consolidating existing test capabilities.
- Establish interim time frames for planned consolidations to provide a means to gauge progress by the Reliance process.
- Provide a lead service in each Reliance area, with funding authority to serve as a single agent to help eliminate existing duplication of test capabilities.
- Increase oversight of lead service efforts to realize the consolidation of test capabilities.

**Matters for
Congressional
Consideration**

If DOD does not take appropriate and timely actions to eliminate duplication of existing test capabilities, the Congress should consider reducing T&E funding to compel DOD to realize significant savings through consolidations.

The Department of Defense's Major Test Ranges

Army

White Sands Missile Range, New Mexico
U.S.A. Kwajalein (atoll), Pacific Ocean
Dugway Proving Ground, Utah
Electronic Proving Ground, Arizona
Aberdeen Proving Ground, Maryland
Yuma Proving Ground, Arizona

Air Force

45th Space Wing (Eastern Range), Florida
30th Space Wing (Western Range), California
Arnold Engineering Development Center, Tennessee
Fighter Weapons Center, Nevada
Air Force Flight Test Center, California
Utah Test and Training Range, Utah
Air Force Development Test Center, Florida
6585th Test Group, New Mexico
4950th Test Wing, Ohio

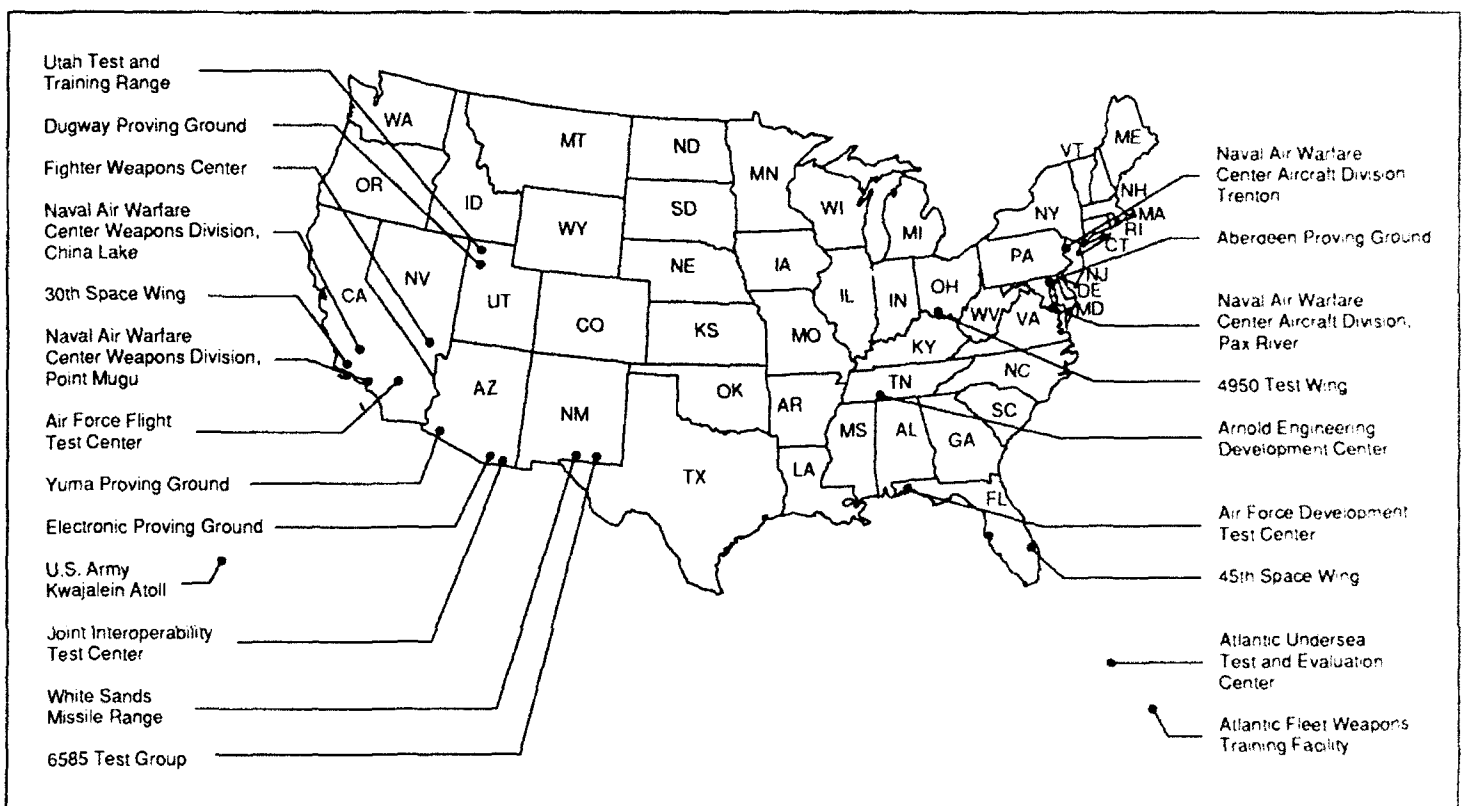
Navy

Naval Air Warfare Center Weapons Division, Point Mugu, California
Naval Air Warfare Center Aircraft Division, Patuxent River, Maryland
Naval Air Warfare Center Weapons Division, China Lake, California
Naval Air Warfare Center Aircraft Division, Trenton, New Jersey
Atlantic Undersea Test and Evaluation Center, Bahamas
Atlantic Fleet Weapons Training Facility, Puerto Rico

Defense Agencies

Joint Interoperability Test Center, Arizona

Locations of Major Test Ranges



Test and Evaluation Funding Trends

The Department of Defense (DOD) believes that funding of its major test ranges has remained constant over the past decade. Because of this level funding, DOD stated that it has not been able to adequately maintain or upgrade its facilities. Our analysis of funding trends, however, shows that the test and evaluation (T&E) funding has actually increased over the last 10 years. The primary difference between our analysis and DOD's is the type of funding included.

DOD Does Not Aggregate All Funding Attributable to T&E

While DOD has a budgetary system for displaying actual and programmed resources, it does not specifically aggregate all resources spent at the major test ranges attributable to T&E. The costs associated with the test ranges include daily operating costs, military personnel salaries, equipment investments, construction of facilities, and charges to customers that use the ranges.

To meet these expenses, DOD uses various funding sources. For example, research, development, test and evaluation (RDT&E) funding is used to finance the direct cost of T&E spent by the users throughout the acquisition cycle. RDT&E funds are also used to finance institutional costs, both operating and investment, at most test ranges. RDT&E funding is further broken down into six specific areas generally designated by specific account numbers: research (6.1), exploratory development (6.2), advanced technology development (6.3), full-scale development (6.4), management and support (6.5), and operational systems development (6.6). The 6.5 designation contains specific T&E support accounts that provide funding for DOD's major test ranges.

In addition to RDT&E funding, the following types of funds are used to support the test ranges:

- Procurement funds are normally used to acquire production items and to fund some direct test costs at the ranges associated with the production equipment.
- Once a weapon system is deployed, operations and maintenance funding is used to pay for the direct cost at the test ranges.
- Military personnel funds are used to employ individuals at the test ranges.
- Other types of funding are also used. For instance, military construction funding is generally used to build facilities at the test ranges.

Analysis of T&E Funding Levels Depends on the Accounts Reviewed

An assessment of the historic funding levels used to support the major test ranges depends on which accounts are included in the assessment. When only the RDT&E management and support accounts were analyzed, T&E funding remained fairly constant over the decade. However, when all funding sources were analyzed, T&E funding increased 25 percent (in constant 1992 dollars) over this time span.

DOD has conducted an in-depth analysis of its T&E capability needs. The analysis of investment trends over the past decade showed that the specific T&E management and support accounts (designated as 6.5) did not keep pace with other RDT&E and procurement funding growth. While some of these support accounts decreased, their overall funding level remained about the same (in constant fiscal year 1992 dollars) during fiscal years 1981-92. On the basis of its analysis, DOD believes that T&E funding did not keep up with its needs to test new or more complex technologies incorporated into its weapon systems. Accordingly, DOD believes that funding for upgrades in the T&E infrastructure and equipment investment has to increase in the future.

Our analysis, which included the other types of funding that support the major test ranges, showed that T&E funding actually increased from \$4.9 billion in fiscal year 1982 to \$6.2 billion in fiscal year 1992, or a 25-percent increase in constant 1992 dollars. Most areas of funding show a real increase, including investments, while some selected T&E areas, such as targets, actually decreased in real terms. (See table III.1.)

Appendix III
Test and Evaluation Funding Trends

Table III.1: T&E Funding Sources
(Fiscal Years 1982 and 1992)

Constant 1992 dollars in millions

T&E area	Amount		Percentage change in 1992 constant dollars
	Fiscal year 1982	Fiscal year 1992	
Institutional funds	\$2,054	\$2,158	5.1
Military personnel	603	499	-17.2 ^a
User funds	1,031	1,666	61.6
Improvement and modernization investments	254	323	27.2
Other investments	18	21	16.6
Military construction	31	362	1,067.8 ^b
General development T&E	169	224	32.5
Targets	156	107	-31.4
Threat simulators	117	181	54.7
Operational T&E	148	238	60.8
Combat development	359	411	14.4
Total	\$4,940	\$6,190	25.3

^aUnlike the percentages presented for the other T&E areas, the change in 1992 constant dollars for military personnel has been adjusted for retired pay accrual as well as price increases.

^bDuring the 10-year period, the level of military construction funding varied from year to year, with the highest funding level realized in fiscal year 1992.

As shown in the table, one of the largest funding increases was in the area of user funds, which accounted for about one-half of the \$1.25 billion increase. These funds were used to employ more personnel at the major test ranges. For example, the number of personnel supported by user funds increased from 11,805 in fiscal year 1981 to 22,039 in fiscal year 1992. The 22,039 personnel included 11,703 personnel funded by specific weapons development customers. The remaining personnel were funded by a combination of science and technology, procurement, operations and maintenance, and other accounts.

In addition, various test investment accounts increased. For example, improvement and modernization investments in test capabilities increased from \$254 million in fiscal year 1982 to \$323 million in fiscal year 1992, or an increase of 27.2 percent in constant 1992 dollars. Further, military construction funding increased from \$31 million to \$362 million in constant 1992 dollars. Although the level of military construction funding varied from year to year, the average level of funding over the period was about \$166 million per year.

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